V.P.A.M.

fx-100s
fx-115s
fx-570s
fx-991s

ENGLISH

英 西 仏 中 韓 ネシア 露 アラ

CASIO®

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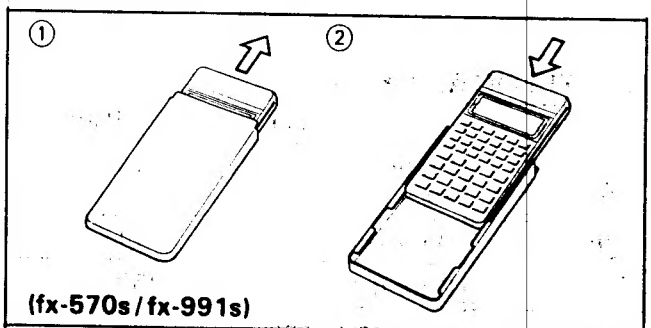
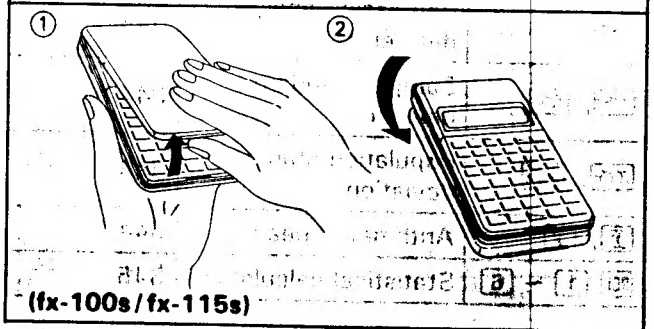
Using the hard case

When inserting the unit into the hard case, be sure to correctly align the tabs of the case with the grooves on the sides of the unit, and then slide the unit in place.

(fx-570s/991s)



(fx-570s/fx-991s)



(fx-100s/fx-115s)

Congratulations on your selection of a CASIO Scientific Calculator. Though operation of this calculator is quite simple, we suggest that you read this operation manual to become familiar with the many features and functions that are now at your fingertips.

To help ensure years of trouble-free operation, do not touch the inside of the calculator, avoid strong impact, and do not press on the keys with undue force. Also remember that extreme cold (below 0°C or 32°F), heat (above 40°C or 104°F), and humidity can have an affect on the functions of the calculator. Never use lacquer thinner, benzine, or other volatile fluids to clean the calculator. For servicing, contact your retailer or a nearby dealer.

Before starting a calculation, be sure to press the [ON] key and confirm that "0." is shown on the display.

* *Special care should be taken to avoid damaging the unit by bending or dropping it. For example, do not carry it in your hip pocket.*

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1/OPERATIONAL FLOW

1-1 Key Markings

Each of the keys is assigned a number of different functions. The key illustrated here, for example, has three different functions.

10^x XOR

log

The following table shows how you access each of the key's functions.

Function	To access
log	This function is accessed whenever you press the key.
10^x	This function is accessed whenever you press SHIFT and then this key.
XOR	This function is accessed whenever you press this key while in the BASE-N Mode.

Keys are marked using various colors. The following table provides the meaning of each color used for key markings.

Color	Meaning
Brown	Function accessed when the key is pressed following SHIFT.
Green	Function accessed when the key is pressed while the unit is in the BASE-N Mode.
Blue	Function accessed when the key is pressed while the unit is in the SD Mode (standard deviation) or LR Mode (linear regression).
Violet	Function accessed when the key is pressed while the unit is in the CMPLX Mode (complex number).

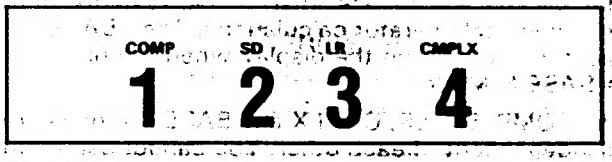
1-2 Modes

Before beginning any calculation, you must first tell the calculator what type of operation you are about to perform. You do this by specifying the proper mode. Use the mode menu to specify the mode that you want.

■ Specifying a Calculation Mode

1. Specifying the COMP Mode, SD Mode, LR Mode, CMPLX Mode

① Press the MODE key and Mode Specification Menu No. 1 appears as shown below.



② Press the number key that corresponds to the calculation mode you want to specify.

The following describes the meaning of each mode.

• 1 – **COMP Mode**
Specify this mode to perform general calculations, including function calculations. The unit of angular measurement is the last one you specified.

• 2 – **SD Mode**
Specify this mode to perform standard deviation calculations. The "SD" indicator is shown on the display when the unit is in the SD Mode.

• 3 – **LR Mode**
Specify this mode to perform linear regression calculations. The "LR" indicator is shown on the display when the unit is in the LR Mode.

• [4] – CMPLX Mode
Specify this mode to perform complex number calcu
lations. The "CMPLX" indicator is shown on the dis
play when the unit is in the CMPLX Mode.

2. Specifying the BASE-N Mode

① Press the [MODE] key five times and Mode Specifica
tion Menu No. 5 appears as shown below.

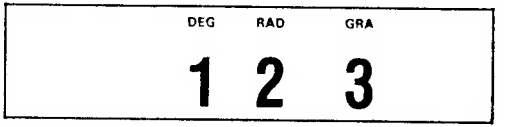
② Press the number [1] key to specify the BASE-N
Mode.

• [1] – BASE-N Mode
Enter this mode to perform conversion between binary,
octal, decimal and hexadecimal number systems, or to
perform logical operator calculations. The "BASE-N"
indicator is shown on the display when the unit is in
the BASE-N Mode.

*The COMP, SD, LR, CMPLX and BASE-N modes are
all independent of each other. You cannot use them
in any combination. Whenever power is switched off
by the Auto Power Off function, restoring power au-
tomatically enters the last mode you were in when
power switched off.

■Specifying an Angle Unit Mode

① Press the [MODE] key two times and Mode Specifica-
tion Menu No. 2 appears as shown below.



② Press the number key that corresponds to the unit
of angular measurement mode you want to specify.
The following describes the meaning of each mode.

• [1] – DEG Mode
Use this mode to specify degrees as the unit of angu-
lar measurement. The "DEG" indicator is shown on the
display when the unit is in the DEG Mode.

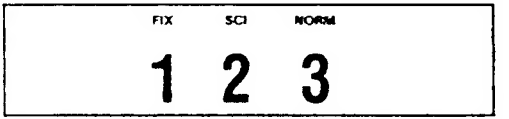
• [2] – RAD Mode
Use this mode to specify radians as the unit of angular
measurement. The "RAD" indicator is shown on the
display when the unit is in the RAD Mode.

• [3] – GRA Mode
Use this mode to specify grads as the unit of angular
measurement. The "GRA" indicator is shown on the
display when the unit is in the GRA Mode.

*The DEG, RAD, and GRA modes can be used in any
calculation mode except the BASE-N Mode.
Whenever power is switched off by the Auto Power
Off function, restoring power automatically enters the
last mode you were in when power switched off.

■Specifying a Display Mode

① Press the [MODE] key three times and Mode Specifica-
tion Menu No. 3 appears as shown below.



② Press the number key that corresponds to the dis-
play mode you want to specify.
The following describes the meaning of each mode.

• [1] – FIX Mode
Use this mode to specify the number of decimal places
to the right of the decimal point. The "FIX" indicator
is shown on the display when the unit is in the FIX
Mode.
When you enter this mode, the message "0 – 9?" ap-
pears on the display. Press a number key from [0] to
[9] to specify the number of decimal places.

Example: To specify three places to the right of the decimal point.

MODE MODE MODE 1 3

• 2 – SCI Mode

Use this mode to specify the number of significant digits. The "SCI" indicator is shown on the display when the unit is in the SCI Mode.

When you enter this mode, the message "0 ~ 9?" appears on the display. Press a number key from 0 to 9 to specify the number of significant digits.

Example: To specify five significant digits.

MODE MODE MODE 2 5

• 3 – NORM 1/NORM 2 Mode

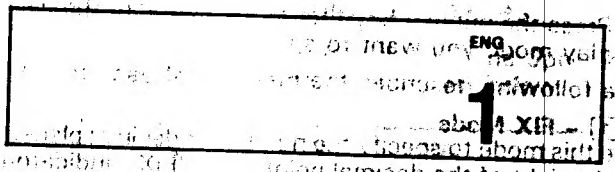
Specify this mode to cancel the number of decimal place and number of significant digit specifications. When you enter this mode, the message "1 ~ 2?" appears on the display. Press the number key 1 or 2 to specify one of the two modes as described below.

*NORM 1 Mode - Values less than 10^{-2} and greater than 10^{10} are displayed using exponential format.

*NORM 2 Mode - Values less than 10^{-9} and greater than 10^{10} are displayed using exponential format.

*The FIX, SCI, and NORM 1/NORM 2 modes are all independent of each other. You cannot use them in any combination. Whenever power is switched off by the Auto Power Off function, restoring power automatically enters the last mode you were in when power switched off.

③ Press the MODE key one more time and Mode Specification Menu No. 4 appears as shown below.



④ Press the number 1 key to specify the ENG Mode.

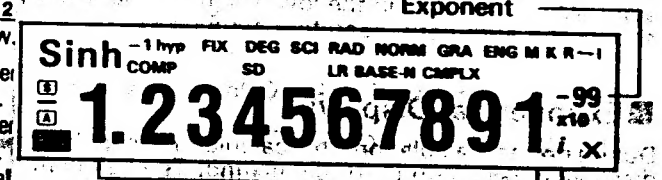
• 1 – ENG Mode

While in the COMP Mode you can specify the ENG Mode to input engineering symbols and use them in calculations. The "ENG" indicator is shown on the display when the unit is in the ENG Mode. See "Engineering symbol calculations" on page 243 of this manual for details.

Important!

When you use the MODE key to select a mode, modes that cannot be entered from the current mode are skipped. If you are in the BASE-N Mode, for example, the Angle Specification Mode is skipped.

1-3 The Display



The display shows input data, intermediate results and results of calculations. The mantissa section displays up to 10 digits. The exponent section displays up to ±99.

Display Symbols

S – SHIFT key operation (page 7)

A – ALPHA (STO + 1x-1 1 15s) or RCL key operation (page-18)

Busy – Calculator is busy executing a calculation

COMP – COMP Mode (page 222)

M – M key operation (page 311)

K – Data stored in memory (page 230)

Constant calculation (page 226)

R↔I	Imaginary number part (page 324)
SD	SD Mode (page 343)
LR	LR Mode (page 351)
CMPLX	CMPLX Mode (page 324)
BASE-N	BASE-N Mode (page 251)
DEG or RAD or GRA	Unit of angular measurement (page 310)
FIX	Number of decimal places (page 316
SCI	Number of significant digits (page 316
NORM	NORM 1/NORM 2 Mode (page 11)
ENG	ENG Mode (page 243)

In addition to the above indicators, the 4-character do area in the upper left of the display shows the calcula tion command symbol (sin, cos, etc.) or the equal symbol. The dot area in the lower right of the displa shows the arithmetic operation symbols.

■Exponential Displays

During normal calculation, this calculator is capable o displaying values up to 10 digits long. The calculato automatically switches over to exponential notation fo any value greater than 9,999,999,999. The lower limi for exponential display is selectable as either NORM 1 or NORM 2 as shown in the following table.

Mode	Lower Limit	Upper Limit
NORM 1	0.01	9,999,999,999
NORM 2	0.000000001	9,999,999,999

You can select between NORM 1 and NORM 2 usin the following procedure.

1. MODE MODE MODE 3
2. Press 1 for NORM 1 or 2 for NORM 2.

There is no indication of which mode is currently in ef fect, but you can confirm the mode by performing th following calculation.

1 ÷ 200 =

= 5. × 10^-03 (NORM 1 mode)

= 0.005 (NORM 2 mode)

(All of the example in this manual show calculation results using the NORM 1 mode.)

■Special Display Formats

Note that special display formats are used for fractional, hexadecimal, sexagesimal (base 60) values and complex number.

- **Fraction Display Format**

= 456⌟12⌟23.

Display of $456\frac{12}{23}$

- **Hexadecimal Display Format**

= AbCdEF12

Display of $ABCDEF12_{(16)} = -1412567278_{(10)}$

- **Sexagesimal Display Format**

= 12°34°56.78

Display of 12°34'56.78"

- **Complex Number Display Format**

= R↔I 2.

Display of 2 + 3*i*
(Real number display)

= R↔I 3. i

(Imaginary number display)

2/BEFORE BEGINNING CALCULATIONS

■Formula Input (V.P.A.M. System)

The V.P.A.M. System of this calculator lets you simply input a formula just as it is written, and then press the [=] key to obtain the result. The execution of arithmetic operations, functions and expressions within parentheses are automatically performed in the correct priority sequence.

*Be sure to press the [AC] key before starting any new calculation.

Example 1: 2 × (3 + 4) = 14

[AC] 2 [×]	2. ×
[(] 3 [+]	(3. +
4 [)]	7.
[=]	= 14.

Example 2: sin30 = 0.5

[sin]	Sin 0.
30	Sin 30.
[=]	= 0.5

■Calculation Priority Sequence

The *calculation priority sequence* is used in mathematics to decide which operation should be performed first. This calculator automatically assigns the calculation priority sequence shown below.

① Type A Functions (where the value is entered first and then the function key is pressed)
x^2, x^{-1}, $x!$, NEG (in the BASE-N Mode)

② Powers, roots x^y, $\sqrt[y]{\ }$
Coordinate conversions R→P, P→R
Permutations, conbinations $_nP_r$, $_nC_r$

③ Type B Functions (where the function key is pressed and then the value is entered)
$\sqrt{\ }$, $\sqrt[3]{\ }$, log, ln, e^x, 10^x, sin, cos, tan, $\sin^{-1}$, $\cos^{-1}$, $\tan^{-1}$, sinh, cosh, tanh, $\sinh^{-1}$, $\cosh^{-1}$, $\tanh^{-1}$, NOT (in the BASE-N Mode)

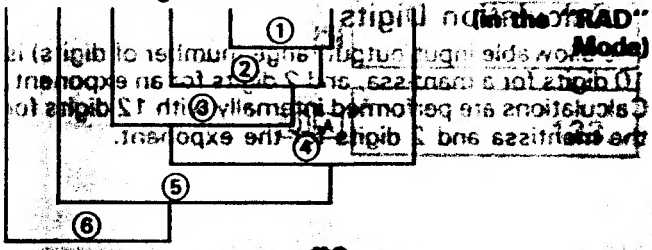
④ Multiplication, division (including constant calculations) ×, ÷

⑤ Addition, subtraction (including constant calculations) +, −

⑥ AND
⑦ OR, XOR, XNOR
} In the BASE-N Mode

*When functions with the same priority sequence are used in series, they are executed from right to left [$e^{\ln\sqrt{120}} \rightarrow e^{\{\ln(\sqrt{120})\}}$]. Other expressions of the same priority sequence are performed from left to right.
*Compound functions are executed right to left.
*Anything contained within parentheses receives highest priority.

Example:
$2 + 3 \times (\log \sin(2 \times \pi) + 6.8) = 22.07101691$ (in the "RAD" Mode)



■Number of Stacks

This calculator uses "stack memory" for temporary storage of low priority numeric values and commands (functions, etc). The numeric stack has 6 levels, while the command stack has 18.

If a complex calculation exceeds the capacity of the stack, and error occurs (indicated by "-E-" on the display).

Example:

2 × (3 − 4 × (5 + 4) ÷ 3) = − 18

① ② ③ ④

1 2 3 4 5 6

Numeric stack

①	2
②	3
③	4
④	5
⋮	

Command stack

1	×
2	(
3	−
4	×
5	(
6	+
⋮	

*Calculations are performed in sequence, with the highest priority operation first. Once a calculation is executed, it is cleared from the stack.

■Number of Input/Output Digits and Calculation Digits

The allowable input/output range (number of digits) is 10 digits for a mantissa, and 2 digits for an exponent. Calculations are performed internally with 12 digits for the mantissa and 2 digits for the exponent.

Example: 3 × 10^5 − 7 =

AC 3 EXP 5 − 7 = → 42857.14286

AC 3 EXP 5 − 7 = → 0.1428571

− 42857 =

■Memory

This unit contains 7 standard memories. There are two basic types of memories, "Variable" memories which are accessed by using the SHIFT STO or STO (fx-115s) and RCL keys in combination with the 7 letters of the alphabet, and "Independent" memory, which is accessed by using the M+, SHIFT M−, M (or RCL M) and SHIFT Ans keys.

Contents of both of the variable and independent memories are protected even when power is turned OFF.

*Variable memory and independent memory utilize the same memory area.

• Variable memories

Up to 7 values can be retained in memory at the same time, and can be recalled when desired.

Example: Inputting 123 into memory "A".

123 → 123.

SHIFT STO A → A= 123.

AC → 0.

RCL A → A 123.

When formulas are input, the result of the formula's calculation is retained in memory.

Example: Inputting the result of 123 × 456 into memory "B".

Keys	Display
AC 123 × 456	456.
SHIFT STO B	B= 56088.
AC	0.
RCL B	B 56088.

• Independent memory

Addition and subtraction results can be stored directly in memory. Results can also be totalized in memory, making it easy to calculate sums.

Example: Inputting 123 to independent memory.

Keys	Display
AC 123	123.
M+	M+ 123.

Recall memory data.

Keys	Display
AC	0.
MR	M 123.

Add 25, subtract 12.

Keys	Display
25 M+ 12 SHIFT M−	M− 12.

Recall memory data.

Keys	Display
AC MR	M 136.

- To clear memory contents, press 0 SHIFT M−, or 0 SHIFT STO M.
- Note that you cannot use the M+ or SHIFT M− memory operations while in the SD or LR Mode. You can perform these memory operations in the CMPLX Mode.

Important!

- Difference between SHIFT STO M and M+, SHIFT M−. Both SHIFT STO M and M+, SHIFT M− can be used to input results into memory, but when the SHIFT STO M operation is used, previous memory contents are cleared. When M+, SHIFT M− is used, the value is added to or subtracted from the value in memory.

■Special Functions

• Answer function

The Answer function stores the result of the most recent calculation. Whenever a numeric value or numeric expression is entered and = is pressed, the result is stored by this function.
To recall the stored value, press the Ans key.

- Since the "Ans" function works just like any other memory, it will be referred to as "Ans memory" throughout this manual.

Example: 123 + 456 = 579
789 − 579 = 210

AC 123 + 456 =

579.

789 − Ans =

210.

Numeric values with 12 digits for a mantissa and 2 digits for an exponent can be stored in the Ans memory. The Ans memory is not cleared even if the power of the unit is turned off. Each time = is pressed the value in the Ans memory is replaced with the value produced by the new calculation. When execution of a calculation results in an error, however, the Ans memory retains its current value.

*Whenever a value is stored in variable memory, the following operations cause the Ans memory content to be updated:
M+, SHIFT M−, %, DATA, or DEL key operations
The SHIFT x⇄y operation updates the Ans memory only when a switch is made between x and y or between r and θ during coordinate transformations (see 11 and 8).

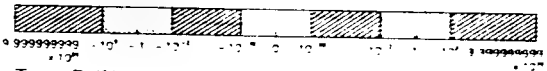
•Continuous calculation function

If you input a Type A function after pressing the = key, the result of the last calculation is applied as a value in the Type A function.

Example: 2 + 7 = √ = is calculated as: $\sqrt{9}$

3/CALCULATION RANGE AND SCIENTIFIC NOTATION

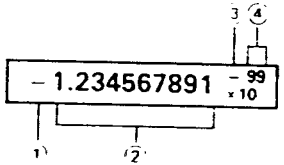
Type A (Norm 1)



Type B (Norm 2)

Normal display
Scientific notation

When a result exceeds the normal display capacity, it is automatically shown in scientific notation, with a 10-digit mantissa and exponents of 10 up to ±99



1) Minus (−) sign for mantissa
2) Mantissa
3) Minus (−) sign for exponent
4) Exponent of ten

The whole display is read:
$-1.234567891 \times 10^{-99}$

*Scientific notation can be input using the EXP key after entering the mantissa.

EXAMPLE	OPERATION	READ-OUT
$-1.234567891 \times 10^{-3}$ $(= -0.001234567891)$		
	1 ⊡ 234567891 [+/-]	−1.234567891
	[EXP]	−1.234567891 $_{\times 10^{00}}$
	3 [+/-]	−1.234567891 $_{\times 10^{-03}}$

4/CORRECTIONS

If you notice an input mistake before you press an arithmetic operation key, simply press [C] to clear the value and enter it again.
You can also use the [►] key to backspace through an entered value until you reach the digit you wish to change and then make any necessary corrections. For example:

To change 123 to 124

123	123.
[►]	12.
4	124.

If you make a mistake by pressing the wrong [+], [−], [×], [÷], [x^2] or [SHIFT] [$\sqrt{}$] key, simply press the appropriate key to correct the error. In this case, the most recently pressed key operation is used, but it retains the order of precedence of the original operation entered.

5/OVERFLOW OR ERROR CHECK

An overflow or error is indicated and further calculation becomes impossible when the symbol "−E−" or "−[−" appears on the display. An overflow or error occurs when any of the following conditions exit.

a) When a result (whether intermediate or final) or accumulated total in the memory is more than $\pm(9.999999999 \times 10^{99})$ ("−E−" sign appears).
b) When function calculations are performed with a value exceeding the input range ("−E−" sign appears).
c) When an unreasonable operation (such as an attempt to calculate $\bar{x}$ and σn while $n = 0$) is performed during statistical calculations ("−E−" sign appears).
d) When a mathematically illegal operation (such as division by zero: $6 \div 0$) is performed ("−E−" sign appears).
e) When the ranges for any of the number systems used in the BASE-N Mode are exceeded. ("−E−" sign appears).
f) When the capacity of the numeric stack or command stack is exceeded ("−[−" sign appears).

Example: pressing [►] 17 times and then executing 2 [+] 3 [×] 4.

To release these overflow checks:
a), b), c), d), e) Press the [AC] key.
f) ..... Press the [AC] key. Or press the [C] key, and the intermediate result just before the overflow occurs is displayed and the subsequent calculation is possible.

*If the result is within the range of $+(1 \times 10^{-99})$ to $-(1 \times 10^{-99})$, an error does not occur. Instead, the display shows all zeros.

Memory protection:
Memory contents are protected against overflow or error and the accumulated total can be recalled by pressing the [MR] key after the overflow check is cleared by the [AC] key.

Before assuming malfunction:
If the calculator starts to produce strange or unexpected results, or if your calculations produce errors, you may be in the wrong mode. Use the following procedure to get the calculator back to the its initial mode settings.
1. Press [MODE] [1] to enter the COMP Mode.
2. Press [MODE] [MODE] [1] to specify the DEG Mode.
3. Press [MODE] [MODE] [3] [1] to specify NORM 1.
Next specify the modes you need to perform your calculation and try again.

6/POWER SOURCE

fx-115s/991s

The CASIO TWO WAY POWER system makes it possible to operate calculators even in complete darkness.

* This unit retains memory contents no matter what the light conditions.
* This unit uses two power sources: a solar cell, and a single G13 Type (SR44 or LR44) battery.
* A weakened battery is indicated when the memory contents spontaneously clear or when the display darkens under poor light conditions and cannot be restored by pressing the [ON] key.
* To ensure proper operation the battery should be replaced once every three years no matter how much the unit is used.

fx-100s/570s

The fx-100s powered by one AA size manganese dry battery (R6P (SUM-3) or UM-3). The fx-570s powered by a single G13 type (SR44 or LR44) battery. As battery power weakens, the characters on the display become dim and difficult to read. When this happens, replace the battery as soon as possible.

Important!

* Be sure to replace the battery at least once every two years, regardless of how much the calculator is used during that time. An old battery may leak, seriously damaging the interior of the calculator.
* The battery that comes installed in the calculator when you purchase it is for factory test purposes, and so it may not provide a full service life.
* All data stored in the memory of the calculator is lost when you replace the battery. Be sure to make a note of any important data before you replace the battery.

■To Replace Batteries

fx-115s/570s/991s

1. Press [OFF] to switch power off. (fx-570s)
2. Remove the screws that hold the back cover in place, and then remove the cover.
3. Remove the old battery by turning the battery compartment face down and lightly tapping the calculator.
4. Wipe off the surfaces of a new battery with a soft, dry cloth, and install the battery with its positive (+) side facing up (so you can see it).
5. Replace the back cover and secure it in place with the screws.
6. Press [ON] to switch power on. (fx-570s)

fx-100s

1. Press [OFF] to switch power off.
2. Remove the screws that hold the back cover in place, and then remove the cover.
3. Remove the old battery.
4. Install a new battery with polarity in correct directions.
5. Replace the back cover and secure it in place with the screws.
6. Press [ON] to switch power on.

Note

The calculator automatically resets its memory. (fx-100s/570s)

Important!

If you allow battery power to drop too low, memory contents may become corrupted or lost completely. Be sure to replace the battery as soon as you notice the display becoming dim.

- Keep batteries out of the reach of small children. If swallowed, consult with your physician immediately.

Never try to charge the batteries, take them apart, or allow them to become shorted. Keep batteries away from flame and direct heat at all times.

Auto Power Off function

This unit automatically switches off if no operation is performed for approximately 6 minutes. Power can be restored by pressing the [ON] key. Memory contents, mode settings are retained even when power is switched off.

7/SPECIFICATIONS

Basic Operations
Negative values; exponents; fractions; four basic arithmetic operations; parentheses calculations

Built-In Functions
Trigonometric/inverse trigonometric functions (degrees, radians, grads for angle units); hyperbolic/inverse hyperbolic functions; common/natural logarithms; powers; roots; square roots; squares, reciprocals; cube roots; factorials; negative signing; exponential input; π; parentheses; random numbers; internal value rounding; unit of angular measurement specification; fractions; decimal ↔ sexagesimal conversions; coordinate conversions (R→P, P→R); engineering calculations; permutation; combination; multi-percent capabilities; number of decimal place/significant digit specification; engineering symbols (9 types)

Statistical Functions

• **Standard Deviation**
Number of data items; mean; standard deviation (two types); sum; sum of squares

• **Regression**
Number of data items; mean of x; mean of y; standard deviation of x (two types); standard deviation of y (two types); sum of x; sum of y; sum of squares of x; sum of squares of y; sum of products of x and y; constant term; regression coefficient; correlation coefficient; estimated value of x; estimated value of y

Complex Number Functions
Four basic arithmetic functions using complex numbers; arguments; absolute values; memory calculations; constants; parentheses; reciprocals

Binary, Octal, Decimal, Hexadecimal Functions
Four basic arithmetic functions using binary, octal, decimal, hexadecimal values; base conversions; negative values (complements); logical operations

Memory
One independent memory; seven variable memories (including independent memory).

Calculation Range
$\pm 1 \times 10^{-99} - \pm 9.999999999 \times 10^{99}$ or 0 (internal calculations are performed using a 12-digit mantissa)

Scientific functions	Input range
$\sin x/\cos x/\tan x$	$\lvert x \rvert < 9 \times 10^{9}$ degrees $\lvert x \rvert < 5 \times 10^{7}\pi$ rad, $\lvert x \rvert < 10^{10}$ gra
$\sin^{-1}x/\cos^{-1}x$	$\lvert x \rvert \leqq 1$
$\tan^{-1}x$	$\lvert x \rvert < 10^{100}$
$\sinh x/\cosh x$	$\lvert x \rvert \leqq 230.2585092$
$\tanh x$	$\lvert x \rvert < 10^{100}$
$\sinh^{-1}x$	$\lvert x \rvert < 5 \times 10^{99}$
$\cosh^{-1}x$	$1 \leqq x < 5 \times 10^{99}$
$\tanh^{-1}x$	$\lvert x \rvert < 1$
$\log x/\ln x$	$10^{-99} \leqq x < 10^{100}$
e^{x}	$-10^{100} < x \leqq 230.2585092$
10^{x}	$-10^{100} < x < 100$
x^{y}	$x>0 \rightarrow -10^{100} < y \cdot \log x < 100$ $x=0 \rightarrow y>0$ $x<0 \rightarrow y$: n or $1/2n+1$ (n : integer) However $-10^{100} < y\log \lvert x \rvert < 100$
$\sqrt[x]{y}$	$y>0 \rightarrow x \neq 0$ $-10^{100} < 1/x \cdot \log y < 100$ $y=0 \rightarrow x>0$ $y<0 \rightarrow x$: $2n+1$ or $1/n$ ($n \neq 0$, n : integer) However $-10^{100} < 1/x \log \lvert y \rvert < 100$
$\sqrt{x}$	$0 \leqq x < 10^{100}$
x^{2}	$\lvert x \rvert < 10^{50}$
$\sqrt[3]{x}$	$\lvert x \rvert < 10^{100}$
$1/x$	$\lvert x \rvert < 10^{100}$ $(x \neq 0)$
$x!$	$0 \leqq x \leqq 69$ (x : integer)
$n\mathrm{P}r/n\mathrm{C}r$	$0 \leqq r \leqq n$, $n < 10^{10}$ (n, r : positive integer)

*Certain combinations or permutations may cause errors due to overflow during internal calculations.

REC→POL	$\sqrt{x^2+y^2} < 10^{100}$
POL→REC	$\lvert\theta\rvert < 9\times10^{9}$ degrees $(<5\times10^{7}\pi$ rad, $<10^{10}$ gra), $0 \leqq r < 10^{100}$
° ′ ″	up to second
π	10 digits

•Complex calculations (A + B*i* and C + D*i*)

*Addition/subtraction

$|A \pm C| < 10^{100}$, $|B \pm D| < 10^{100}$

*Multiplication

$|AC| < 10^{100}$, $|BD| < 10^{100}$, $|AC - BD| < 10^{100}$

$|BC| < 10^{100}$, $|AD| < 10^{100}$, $|BC + AD| < 10^{100}$

*Division

$|AC| < 10^{100}$, $|BD| < 10^{100}$, $|AC + BD| < 10^{100}$

$|BC| < 10^{100}$, $|AD| < 10^{100}$, $|BC - AD| < 10^{100}$

$C^2 + D^2 \neq 0$, $C^2 < 10^{100}$, $D^2 < 10^{100}$, $C^2 + D^2 < 10^{100}$

*Errors are cumulative with such internal continuous calculations as x^y, $\sqrt[y]{}$, $x!$, $\sqrt[3]{}$ so accuracy may be adversely affected.

***Output accuracy**
±1 at the 10th digit.

Decimal Point
Full-floating with underflow
Exponential display is automatically used outside the following ranges.

NORM 1 Mode: $10^{-2} > |x|$, $|x| \geqq 10^{10}$

NORM 2 Mode: $10^{-9} > |x|$, $|x| \geqq 10^{10}$

Power Supply
- **fx-100s**
  One AA size manganese dry battery (Type UM-3 or R6P (SUM-3)).
- **fx-570s**
  One button-type battery (Type G13 (SR44 or LR44)).
- **fx-115s/991s**
  Solar cell, one button-type battery (Type G13 (SR44 or LR44)).

Battery Life
- **fx-100s**
  Approximately 2 years continuous operation on type UM-3 or type R6P (SUM-3).
- **fx-570s**
  Approximately 7,000 hours continuous operation on LR44 battery.
  (15,000 hours on SR44 battery).
- **fx-115s/991s**
  Approximately 3 years (1 hour use per day) on LR44/SR44 battery.

Auto Power Off Function
Automatically switches power off if no operation is performed for about six minutes.

Operating Temperature:
0°C – 40°C (32°F – 104°F)

Dimensions:
- **fx-100s** 26.5mmH × 77mmW × 153.4mmD
  (1″H × 3″W × 6″D)
- **fx-115s** 23.9mmH × 77mmW × 153.4mmD
  ($^{15}/_{16}$″H × 3″W × 6″D)
- **fx-570s/991s** 8.8mmH × 73mmW × 144mmD
  ($^{3}/_{8}$″H × 2$^{7}/_{8}$″W × 5$^{5}/_{8}$″D)

Weight:
- **fx-100s** 128g (4.5oz) including battery
- **fx-115s** 114.3g (4.0oz) including battery
- **fx-570s** 73g (2.6oz) including battery
- **fx-991s** 74.3g (2.6oz) including battery